

*On the character of the chief line of the Nebula in Orion.*

By Kavasgee D. Naegamvala, M.A.

Mr. Lockyer bases the claim of the chief nebula line to belong to magnesium, on the ground first that according to his observations it is exactly coincident with the first magnesium fluting, and secondly that it has the character not only of the remnant of a fluting, but of the fluting of magnesium, inasmuch as the line has been observed by him and by others to be *less* well defined on the violet side than on the red.

The recent researches of Dr. and Mrs. Huggins, followed by those of Mr. Keeler, have shown that the claim of perfect coincidence with the first magnesium fluting advanced by Mr. Lockyer for the chief nebula line is not tenable, while the fluted character of the line itself has been very much called in question of late.

Mr. Lockyer in his "Meteoritic Hypothesis" states that "observations of nebulae should show that a fluting and not a line is in question," and as for instrumental means to be employed for this particular purpose he remarks that "high dispersion is not so likely to show the fluted character of the chief line as low."

I have therefore felt that the instrumental means at my disposal were well suited for a determination of the *character* of the line in question, and I have with that view examined the *Orion* nebula on numerous occasions during the last two months.

The telescope employed has been a silver-on-glass Newtonian by Sir Howard Grubb of  $16\frac{1}{2}$ -inch aperture, while three different spectroscopes have been successively brought to bear upon the nebula. The first one employed was a direct-vision McClean Spectroscope, by Browning, with a slit opening only in one direction; while the second instrument was a rain-band spectroscope by Negretti and Zambra, provided with an eye-piece and easily, though not very widely, separating the D line; the slit of this spectroscope was also made to open only in one direction. The third spectroscope was a star single prism spectroscope by Grubb of his well-known form, with this difference, that, instead of the usual compound prism, a large prism of flint was substituted; the lenses of this spectroscope are an inch and a half in diameter, the telescope is provided with a battery of four eye-pieces, and the slit opens equally in both directions. The instrument gives spectra of exceptional brilliancy and of great definition.

Neither of the three spectroscopes has revealed any "fluted" characteristics in the chief line. On several occasions the line was observed not only well defined but *very sharp* and clear cut, having all the characteristics of a line proper; while any want of definition or clearness—in other words, the existence of any

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raggedness—on one side was accompanied by a similar appearance on the other. The slit of the rain-band spectroscope was turned through  $180^\circ$  without changing the character of the line. With the Grubb spectroscope the whole battery of eye-pieces was successively employed and the width of the slit was varied through the fullest extent. Any widening of the slit invariably broadened the line *equally* in both directions *without any falling off in intensity on the violet side*, and in this particular the other two lines behaved precisely in the same fashion as the “chief line,” all three being in the same field of view.

After a most careful examination, therefore, of the line in question, I have been forced to come to the conclusion that it does *not* reveal to me the character of “the remnant of a fluting” of magnesium.

I propose shortly to examine the chief line of the nebula from the point of view of coincidence by the siderostatic method.

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*Erratum in Radcliffe Observations of Iris Comparison Star.*

Arg. Z.  $+20^\circ$ , 341 (*Monthly Notices*, vol. xlix. 7, p. 392 and p. 396).  
For  $69^\circ 9' 1''.59$  read  $69^\circ 9' 3''.55$ .